AMENDMENTS TO THE DRAWINGS:

Replacement sheets for Figures 2, 4, and 5 are submitted herewith.

REMARKS

The Examiner is thanked for the careful examination. However, in view of the following remarks, the Examiner is respectfully requested to reconsider and withdraw the rejections.

The foregoing amendments should address the issues raised by the Examiner under 35 USC 112 and the claim objections. The amendments do not change the scope of the claims.

Claim 1 has ben rejected as allegedly being anticipated by the Applicant's Admitted Prior Art (AAPA). However, the Examiner's analysis of the present invention defined by the current claim 1 and the prior art is not accurate.

Claim 1 defines the radius r_{21} of the working pitch circle of the planetary gear meshing with the sun gear as being larger than the radius r_{23} of the working pitch circle of the planetary gear meshing with the internal gear:

$r_{21} > r_{23}$

In contrast to claim 1, the prior art as shown in Fig. 5 of the present application is the case where the radius r_{21} of the working pitch circle of the planetary gear meshing with the sun gear ***is equal to*** the radius r_{23} of the working pitch circle of the planetary gear meshing with the internal gear: $r_{21} = r_{23}$ and is thus different from the present invention. In Fig. 5, the radius of the working pitch circle of the planetary gear meshing with the sun gear is not specifically illustrated, but is the radius of the planetary gear plus Δr_1. Thus, the radius of the working pitch circle of the planetary gear meshing with the sun gear is effectively r_2. In Fig. 5, the radius of the working pitch circle of the planetary gear meshing with the internal gear is illustrated specifically as r_2.

Thus, the relationship between the sun gear and planetary gear is not the same as that between the planetary gear and internal gear.

In the Official Action, the Examiner quotes the following equation:

r' = (operating centre distance of mesh)/((z2/z1)+1).

However, this equation generally defines the working pitch circle of an external gear ***when external gears*** are meshed with each other. Thus, the obtained r' is a working pitch circle of the sun gear. When obtaining the working pitch circle of the planetary gear, the following equation must be used:

r' = (operating centre distance of mesh)/((z1/z2)+1).

Further, when obtaining the working pitch circle of a pinion meshing with an internal gear, the following equation must be used, wherein z1 is the number of teeth of the pinion and z2 is the number of teeth of the internal gear:

r' = (operating centre distance of mesh)/((z2/z1)-1).

For a better understanding, in a planetary gear device, the following equations (1) to (5) are satisfied, wherein

z1: number of sun gear teeth

z2: number of planetary gear teeth

z3: number of internal gear teeth

c: center distance of mesh

r_1: radius of the working pitch circle of the sun gear

r_2: radius of the working pitch circle of the planetary gear

r_{21}: radius of working pitch circle of planetary gear meshing with sun gear

r_{23}: radius of working pitch circle of the planetary gear meshing with internal gear

r_3: radius of working pitch circle of the internal gear meshing with the planetary gear:

$$r_1 = c/((z2/z1)+1) \quad (1)$$

$$r_{21} = c/((z1/z2)+1) \quad (2)$$

$$r_{23} = c/((z3/z2)-1) \quad (3)$$

$$r_3 = c/((1-(z2/z3)) \quad (4)$$

$$c = r_1 + r_2 = r_3 - r_2 \quad (5)$$

The following equation is satisfied in the case of the prior planetary gear device as shown in Fig. 5 of the present application.

$$z1 + z2 = z3 - z2 \quad (6)$$

Therefore, the following equation is satisfied.

$$r_{21} = r_{23} \quad (7)$$

As mentioned above, according to the present invention as defined by the current claim 1, $r_{21} > r_{23}$, which is different from the prior art planetary gear device.

In the middle portion of page 5 of the official action, the examiner stated that the operating centre distance of mesh is equivalent to (r2). This is incorrect. The operating centre distance of mesh (c) is defined by the above-mentioned equation (5) and is not equal to r_2.

Further, in the official action, the examiner alleges that if $z1 < z2 < z3$ is satisfied, it always satisfies the relation of $r_{21} > r_{23}$. This is not accurate. Generally, r_{21} and r_{23} are equal as defined by the equation (7).

In contrast, according to the present invention, the following equation is satisfied.

$$r_{21} > r_{23} \quad (8)$$

In order to satisfy the equation (8), the following condition must be satisfied.

$(z1 + z2) < (z3 - z2)$ (9)

If $(z1 + z2)$ is larger than $(z3 - z2)$, r_{21} becomes larger than r_{23}, while if the former is equal to the latter, then r_{21} becomes equal to r_{23}. These cases are excluded from the scope of the present invention.

In summary, in the prior art planetary gear device as shown in Fig. 5,

$(z1 + z2) = (z3 - z2)$ and $r_{21} = r_{23}$, wherein the frictional forces between the friction rollers operate in an opposite manner.

According to the present invention,

$(z1 + z2) < (z3 - z2)$ and $r_{21} > r_{23}$, wherein the frictional forces between the friction rollers operate in a cooperative manner.

Examples are shown in the following:

Example 1 (present invention):

c = 30.1436, z1=24, z2=35, z3=96, (z1+z2) = 59, (z3-z2) = 61

r_{21}=17.8818, r_{23}=17.2955 (thus, $r_{21}>r_{23}$)

Example 2 (the prior planetary gear device as shown in Fig. 5):

c=30.1436, z1=24, z2=36, z3=96, (z1+z2) = (z3-z2) = 60

r_{21}=18.0862, r_{23}=18.0862 (thus, $r_{21}=r_{23}$)

Comparative Example:

c=30.1436, z1=24, z2=37, z3=96, (z1+z2)=61, (z3-z2)=59

r_{21}=18.2835, r_{23}=18.9036 (thus, $r_{21}< r_{23}$)

Accordingly, the Examiner is respectfully requested to reconsider and withdraw the outstanding objections and rejections. In the event that there are any questions concerning this amendment, or the application in general, the Examiner is urged to telephone the undersigned.

Respectfully submitted,

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